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Reproduction of mildews.

HARPER has brought together the results of several years of study of nuclear activities in the mildews in a lengthy and beautifully illustrated publication from the Carnegie Institution.² It is impossible for us to consider more than the striking new features of his investigations. The paper contains a résumé of much of his earlier work and a broad discussion of many cytological principles which are of general interest and will richly repay the reader of this very creditable contribution to American botany. The author takes a strong stand for critical morphological analysis and classification of the stages in the life history of thallophytes, with a clear separation of phylogenetic history from physiological functions.

The most important new features of HARPER'S research, chiefly in *Phyllactinia*, are (1) the establishment of a "central body" within the nucleus, which constitutes a point of attachment for the chromatic elements and gives a clear polarity to the structure, and its continuous existence through the most important phases in the life history; (2) the evidence for the permanence of the chromosomes; and (3) the evidence that the triple mitoses preceded by synapsis in the ascus constitute a double reduction of the chromosomes which are quadrupled by the two nuclear fusions in the life history, the first fusion at the time of the sexual act and the second fusion within the young ascus.

The central body is a permanent structure, always present in the resting nucleus, dividing with each mitosis, and the center for an arrangement of chromatic threads within the nucleus and for the attachment of spindle fibers during nuclear division. Its position determines a pole in the nucleus around which are grouped the chromatic elements, which are thus always in connection with the central body, both in the resting nucleus and during mitosis. This constitutes new evidence for the permanence of the chromosomes throughout the succession of mitoses in the life-history. HARPER has not been able to distinguish the different sets of chromosomes after the nuclear fusions, for the chromatic elements and the central bodies unite very intimately. But the second fusion in the life history, that in the ascus, is followed at once by a period of synapsis and the triple mitoses out of which come the eight chromosomes characteristic of the gametophytic phase of the form.—B. M. DAVIS.

MINOR NOTICES.

Observations in Spitzbergen.—The flora of Spitzbergen is fairly known. Therefore, DR. WULFF, who accompanied the Swedish expedition for the measurement of an arc of the meridian, undertook to make ecological observations on the arctic plants,³ especially touching their transpiration, occurrence of mycorrhiza

² HARPER, R. A., Sexual reproduction and the organization of the nucleus in certain mildews. Imp. 8vo. pp. 104. *pls.* 7. Washington: Carnegie Institution of Washington. 1905.

³ WULFF, THORILD, Observations botaniques faites au Spitzberg. Missions scientifique pour la mesure d'un arc de méridien au Spitzberg. Mission Suédoise. Tome II, X^e section, Botanique. Traduit de l'Allemand par H. MARCEL HARDY à Dundee. 4to. pp. 63, *pls.* 4. Stockholm. 1903.

and anthocyan, the vegetation of the "polygonal" soils, and to make miscellaneous floristic notes at various stations. The transpiration he finds very feeble and almost without diurnal periodicity or plant control. This feeble transpiration he accuses of being a *cause* of feeble growth; instead, is not its feebleness due to the same cause as the feebleness of growth, the low supply of energy? Mycorrhizas, internal and external, are common. Anthocyan is found in fifty species, about half the known higher plants. It is always lacking in plants growing on soil enriched by the droppings of wild birds, whereas the same species growing on poor soils show it abundantly. As to the rôle of anthocyan, he holds it for an absorber of energy, and without it no plant can become dominant in arctic regions. For other interesting observations one must consult the work itself.—C. R. B.

Polypodiaceæ and edible fungi.—Not that there is any connection between them; but both are treated by COPELAND in a bulletin⁴ from the Government Laboratories at Manila. The section on Polypodiaceæ forms the bulk of the bulletin and is "an attempt to collect and publish descriptions of all the ferns known to have been found in these islands." The author adds: "I am not personally acquainted with a large part of those ferns still known here only from earlier collections." Which leads us to remark that he should then have abstained from describing a new genus and new species among them, as he did in DR. PERKINS's last *Fragmenta*. In reprinting here these descriptions he has neglected to indicate that they have already been published elsewhere. He has sinned again in adding one more new name in this bulletin. The compilation of such descriptive floras is undoubtedly serviceable; but one who is not a taxonomist and who confesses the absence of indispensable books and specimens, should not take the chances of cumbering pteridology with new names which may or may not be justified. And the same may be said regarding the brief fungus part.—C. R. B.

Genera of Mexican plants.—The flora of Mexico is so closely related to our own that any work on it is of essential assistance to American taxonomists. So we welcome the assembling and description of the Mexican genera, and the listing of the species, undertaken by Professor CONZATTI, director of the State Normal School of Oaxaca, of which the first volume, on Polypetalæ, has recently been published by the Ministry of Public Works. This volume⁵ begins with an artificial key covering about 50 pages including all genera, and contains descriptions of 667 genera of Polypetalæ, representing 71 families, and including close to 4,500 species. This is to be followed by another on Gamopetalæ and a third

⁴COPELAND, E. B., I. The Polypodiaceæ of the Philippine Islands. II. New species of edible Philippine fungi. Bureau of Government Labs. Bull. 28. 8vo. pp. 146. *pls.* 3. 1905.

⁵CONZATTI, C., Los géneros vegetales mexicanos. Imp. 8vo. pp. 449. Mexico: Oficina Tip. de la Secretaría de Fomento. 1905. \$3 (Mexican).